

CLAIMS

We claim:

1. A device comprising:
 - i) a housing comprised of a substrate;
 - ii) a fluid transport channel in said substrate, said channel connecting to a reaction region; and
 - iii) a series of heating elements arrayed along said fluid transport channel, wherein said series of heating elements are configured so as to provide differential heating.
2. The device of Claim 1, wherein said heating elements are comprised of aluminum.
3. The device of Claim 1, wherein said transport channel is treated with a hydrophilicity-enhancing compound.
4. The device of Claim 1, wherein said substrate comprises silicon.
5. The device of Claim 4, wherein said substrate further comprises a first silicon oxide layer, a silicon nitride layer, and a second silicon oxide layer.
6. The device of Claim 1, further comprising a second microdroplet transport channel in said substrate.
7. The device of Claim 6, wherein said first and second transport channels are etched in said substrate.

8. A system comprising:

- i) a microdroplet;
- ii) first and second microdroplet transport channels in a substrate, said channels connecting to a reaction region; and
- iii) a series of heating elements arrayed along said first and second transport channels, wherein said series of heating elements are configured so as to provide differential heating of said microdroplet by said heating elements.

9. The system of Claim 8, wherein said microdroplet comprises organic material.

10. The system of Claim 9, wherein said organic material is selected from the group consisting of proteins, lipids, and nucleic acids.

11. The system of Claim 8, wherein said first and second transport channels are etched in said substrate.

12. The system of Claim 11, wherein said substrate comprises silicon.